



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/618,874

07/14/2003

Mukul Saran

TI-30597.1

5871

23494

7590

12/28/2004

TEXAS INSTRUMENTS INCORPORATED

P O BOX 655474, M/S 3999

DALLAS, TX 75265

EXAMINER

HA, NATHAN W

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/618,874

Applicant(s)

SARAN, MUKUL

Examiner

Nathan W. Ha

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 9-~~14~~ are rejected under 35 U.S.C. 102(e) as being anticipated by Ning et al. (US 6,677,635, previously cited, hereinafter, Ning.)

In regard to claim 9, in fig. 5, Ning discloses a method of forming an IC capacitor (see the abstract), comprising:

providing a silicon substrate, not shown, with a first dielectric film 11 (col. 4, line 9) containing at least one copper layer 10 (col. 4, lines 8-10);

forming a second dielectric layer 12, or etch-stop/barrier layer, (col. 4, lines 13-14) over the first dielectric layer and the copper layer wherein the second dielectric layer (etch-stop layer) contacts the copper layer;

forming a first conductive layer 16, or cap plate, (col. 4, line 43) over the first dielectric layer wherein the first conductive layer contacts the second electric layer (etch-stop layer), see fig.5; and

removing portion of the first conductive layer such that a portion of the second dielectric layer remains between the first conductive layer and the copper layer wherein these layers formed a capacitor structure. See col. 4, lines 1-10.

In regard to claim 10, Ning further discloses forming copper contacts to the first conductive layer, see fig.5 (from the top); and

forming a second copper layer that electrically contacts the copper contacts (fig. 5, where in the contacts made through a via in the dielectric layer.)

In regard to claim 11, the first conductive layer suggested to be aluminum, see col. 4, lines 45-47.

In regard to claim 12, see fig. 5, where the dielectric layer is formed using a least two dielectric films, including 15, for example.

In regard to claim 13, layer 12 may be considered as a barrier layer.

In regard to claim 14, the dielectric layer is made of silicon nitride. See col. 4, lines 15-17.

It should be noted that even though Ning does not label dielectric layer 12 as a etch-stop/barrier layer, but this layer is made of the same material as disclosed by the instant invention, Silicon nitride (col. 4, lines 17-19). Therefore, the dielectric layer 12 functions as a barrier layer.

Response to Arguments

3. Applicant's arguments filed 8/23/04 have been fully considered but they are not persuasive. For instance, Applicants contend that the cited art does not disclose an

Art Unit: 2814

etch-stop/barrier layer. As discussed above, the dielectric layer 12 is made of the same material, silicon nitride. This material is in fact the same material as the etch-stop layer as claimed. Therefore, the Ning's device indeed discloses an etch-stop layer, which is capable of having the same property as the etch-stop layer as claimed in the instant invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan W. Ha whose telephone number is (571) 272-1707. The examiner can normally be reached on M-TH 8:00-7:00(EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A handwritten signature in black ink, appearing to read "Nathan W. Ha", with a stylized flourish at the end.

Nathan Ha
December 22, 2004